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New cercosporoid fungi from the Brazilian Cerrado 2. Species on hosts of the subfamilies *Caesalpinioideae*, *Faboideae* and *Mimosoideae* (*Leguminosae* s. lat.)

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Abstract — The genus *Passalora* is divided into the morphological sections *Passalora*, *Phaeoramularia*, *Mycovellosiella and Pseudophaeoisariopsis*. New cercosporoid hyphomycetes are described from the Brazilian Cerrado on native plants of the subfamilies *Mimosaoideae* (*Cercospora mimosae-sensitivae*), *Faboideae* (*Passalora* sect. *Mycovellosiella*: *P. acosmii*), and *Caesalpinioideae* (*Passalora* sect. *Mycovellosiella*: *P. chamaecristae-orbiculatae*; *Passalora* sect. *Passalora*: *P. chamaecristicola, P. machaerii*; *Pseudocercospora*: *P. exilis, P. chamaecristigena,* and *P. luzianiensis*). Furthermore, the new combinations *Passalora caesalpiniae* (≡ *Phaeoramularia caesalpiniae*), *P. dalbergiae* (≡ *Mycovellosiella dalbergiae*), *Pseudocercospora bonducellae* (≡ *Helminthosporium bonducellae*) and the new name *Pseudocercospora caesalpiniicola* (≡ *Phaeoisariopsis caesalpiniae*, non *Pseudocercospora caesalpiniae*) are introduced.

Key words — fungal taxonomy, mycodiversity, *Mycosphaerellaceae*, tropical hyphomycetes

Introduction

The traditional *Leguminosae* (including sufamilies *Caesalpinioideae*, *Faboideae*, and *Mimossoideae*) is one of the largest families of flowering plants with ca 18,000 species grouped in about 650 genera, just under a twelfth of all known flowering plants. They are cosmopolitan but especially common in tropical and subtropical areas. They are annual or perennial plants with habits varying from creeping herbs to high trees; some are leafless xerophytes (Polhill & Raven 1981).

The three families of the *Leguminosae* s. lat. are also the largest group of flowering plants in the Cerrado, represented by 101 genera, 777 species and 143 varieties

[1]Portion of the Doctor´s Thesis of the senior author

and subspecies, respectively (Mendonça et al. 1998). Among the most common genera in the Cerrado are *Acosmium*, *Bowdichia*, *Calliandra*, *Dimorphandra*, *Chamaecrista*, *Galactia*, *Machaerium*, *Dalbergia*, *Mimosa*, *Pterodon*, *Senna*, *Sclerolobium* and *Stryphnodendron*.

A continued survey of Cerrado fungi on legumes revealed several new species of the genera *Cercospora* Fresen., *Passalora* Fr. and *Pseudocercospora* Speg. They are described in this contribution which continues the treatment of cercosporoid hyphomycetes of the Cerrado by Hernández-Gutiérrez & Dianese (2008).

As in the previous paper of this series, the taxonomy follows the generic concepts introduced by Deighton (1967, 1974, 1976) and updated by Braun (1999) as well as Crous & Braun (2003), showing the delimitation between *Passalora*, *Phaeoramularia* and *Mycovellosiella* to be vague and not justified, neither on the base of morphological features, since various intermediate taxa exist, nor by using molecular approaches. The broad morphological range of *Passalora* in its current, wide circumscription agrees now with the well-known, traditional concept of *Pseudocercospora*, comprising species with and without external mycelium, with solitary and fasciculate conidiophores, up to sporodochia and synnemata, but all connected by a single, uniform type of conidiogenous locus and conidial hilum. Special taxonomic problems arose around synnematous cercosporoid fungi traditionally assigned to the genus *Phaeoisariopsis* Ferraris. Braun (1990) reallocated cercosporoid *Isariopsis* Fresen. (now *Phacellium* Bonord.) species with pigmented, scolecoid conidia to *Phaeoisariopsis*. As in numerous other hyphomycete genera, it turned out that the formation of synnematous conidiomata is of little taxonomic relevance at generic level in cercosporoid anamorphs. Furthermore, the genus *Phaeoisariopsis* proved to be heterogeneous, comprising passalora-like species with conspicuous, thickened and darkened conidiogenous loci as well as pseudocercospora-like taxa with inconspicuous loci (Deighton 1990, Crous & Braun 2003). Since the type species of *Pseudocercospora*, *P. vitis* (Lév.) Speg., also shows synnematous conidiomata (Deighton 1976), it is artificial and not justified to place other synnematous taxa with unthickened, non-pigmented conidiogenous loci in a separate genus. Based on a molecular and morphological reassessment of *Phaeoisariopsis griseola* (Sacc.) Ferraris, the type species, Crous et al. (2006) reduced the genus *Phaeoisariopsis* to synonymy with *Pseudocercospora*.

Phaeoisariopsis griseola is characterized by having conidiogenous loci ranging from being quite inconspicuous to subconspicuous by being unthickened, but slightly darkened-refractive, at least with regard to the ultimate rim. Since *P. griseola* molecularly clustered within a subclade formed by other *Pseudocercospora* species, it became clear that synnematous taxa with minutely thickened and slightly darkened conidiogenous loci have to be placed in

Pseudocercospora. Hence, species of *Phaeoisariopsis* were reallocated to *Passalora* and *Pseudocercospora*, respectively, depending on the structure of the conidiogenous loci. With regard to former *Phaeoisariopsis* species on legumes, *P. atropunctata*, *P. pulchella* and *P. robiniae* (Shear) Deighton belong now in *Passalora*, whereas *P. bonducellae*, *P. caesalpiniae* and *P. griseola* are now members of *Pseudocercospora* (Crous & Braun 2003). However, most of the species on legumes previously referred to as *Phaeoisariopsis* have already been excluded by previous authors, since they are characterized by having densely fasciculate, but non-synnematous conidiophores, e.g. *Pseudocercospora angustata* (Chupp & Solheim) Deighton (≡ *Phaeoisariopsis angustata* (Chupp & Solheim) L.G. Br. & Morgan-Jones), *Passalora personata* (Berk. & M.A. Curtis) S.A. Khan & M. Kamal (≡ *Phaeoisariopsis personata* (Berk. & M.A. Curtis) Arx).

However, Braun (1995, 1998) introduced formal, non-phylogenetic divisions of *Cercosporella* Sacc., *Pseudocercosporella* Deighton, and *Ramularia* Unger into sections based on morphology, which are useful for taxonomic as well as determination purposes. A similar concept is here applied to *Passalora*, as follows:

Passalora* sect. *Passalora

Superficial mycelium absent; conidiophores fasciculate; conidia solitary, subglobose, ellipsoid-ovoid, fusiform to obclavate-cylindrical, subhyaline to usually pigmented, 0–4- to sometimes pluriseptate.

Passalora* sect. *Phaeoramularia (Munt.-Cvetk.) A. Hern.-Gut. & Dianese, **comb. et stat. nov.**

MycoBank, MB 512204

Bas.: *Phaeoramularia* Munt.-Cvetk., Lilloa 30: 182, 1960.

Superficial mycelium absent; conidiophores fasciculate; conidia catenate, in simple or branched chains, variable in shape, 0–1- to pluriseptate.

Passalora* sect. *Mycovellosiella (Rangel) A. Hern.-Gut. & Dianese, **comb. et stat. nov.**

MycoBank, MB 512205

Bas.: *Mycovellosiella* Rangel, Arch. Jard. Bot. Rio de Janeiro 2: 71, 1917.

Superficial mycelium present, smooth; conidiophores solitary, arising from superficial hyphae or solitary as well as fasciculate; conidia solitary or catenate, variable in shape, continuous to pluriseptate, subhyaline to pigmented.

Passalora* sect. *Pseudophaeoisariopsis U. Braun, Dianese & A. Hern.-Gut., **sect. nov.**

MycoBank, MB 512206

Sine mycelio superficiali, conidiophora longa et dense aggregata, synnemata formantia, conidia solitaria.

Type species: *Passalora atropunctata* (Racib.) U. Braun & F. O. Freire (≡ *Cercosporella atropunctata* Racib.).

Superficial mycelium absent; conidiophores long, densely aggregated, forming genuine synnemata; conidia solitary.

Taxonomy

Cercosporoid fungi on *Mimosoideae*

Cercospora mimosae-sensitivae A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 1
MycoBank, MB 512207

Cercosporae sensitivae *ut videtur similis, sed lesionibus differentibus, conidiophoris longioribus et conidiis distincte longioribus, leviter latioribus et pluriseptatis. Differt a C.* apii *s. lat. (incl.* C. canescens) *conidiis saepe anguste obclavatis, ad basim obconice truncatis.*

Specimens examined: **BRAZIL. Maranhão:** Grajaú, on living leaves of *Mimosa sensitiva*, 5 Apr 1995, *leg. M. Sanchez* 734, **holotype** (UB Mycol. Col. 8303).

Etymology: *mimosae-sensitivae*, derived from the host species.

Lesions 0.5–4 mm diam., amphigenous, circular, brown, greyish in the centre, limited by a dark brown margin and surrounded by a yellowish halo. Colonies amphigenous, caespitose, shiny gray or grayish brown. Stromata absent or poorly developed, textura globosa, superficial, light brown, 13–75 µm diam. Conidiophores loosely fasciculate, simple, straight or slightly curved, cylindrical, 49–131 µm long, 4–7 µm diam. at the widest part, 1–6-septate, light brown, smooth, thin-walled. Conidiogenous cells integrate, terminal or intercalary, polyblastic, sympodial, geniculate, cylindrical, light brown to subhyaline, scars very prominent, thick and dark, 2–3 µm diam. Conidia solitary, curved, flexuous or straight, filiform, narrowly obclavate, sometimes fusoid, truncate to obconical-truncate at the base, obtuse to rounded at the apex, 32–225 µm long, 3–5 µm diam. in the widest part, 2–4 µm at the base, 1–2 µm near the apex, 2–20-septate, hyaline, smooth, thin-walled; hilum prominent, thick and dark, 2–3 µm wide.

Comments: *Cercospora sensitivae* (Speg.) Chupp (≡ *Cercosporina sensitivae* Speg.) was described from Argentina on *Mimosa sensitiva* (Chupp 1954). Chupp (1954) characterized this species as follows: Leaf spots subcircular or irregular; colonies hypophyllous; stromata dark brown; conidiophores in dense or very dense fascicles, unbranched, curved or flexuous, rarely geniculate, 15–70 µm long (mainly 15–50 µm) and 4–6 µm diam. at the widest part, with small scars; conidia hyaline, cylindrical or almost fusoid, straight or curved, 20–75 µm long and 2–4 µm diam. at the widest part, 3–7 septate. However, the new species on *Mimosa sensitiva* in Brazil differs from Spegazzini´s species in having different leaf spots, longer conidiophores, distinctly longer and

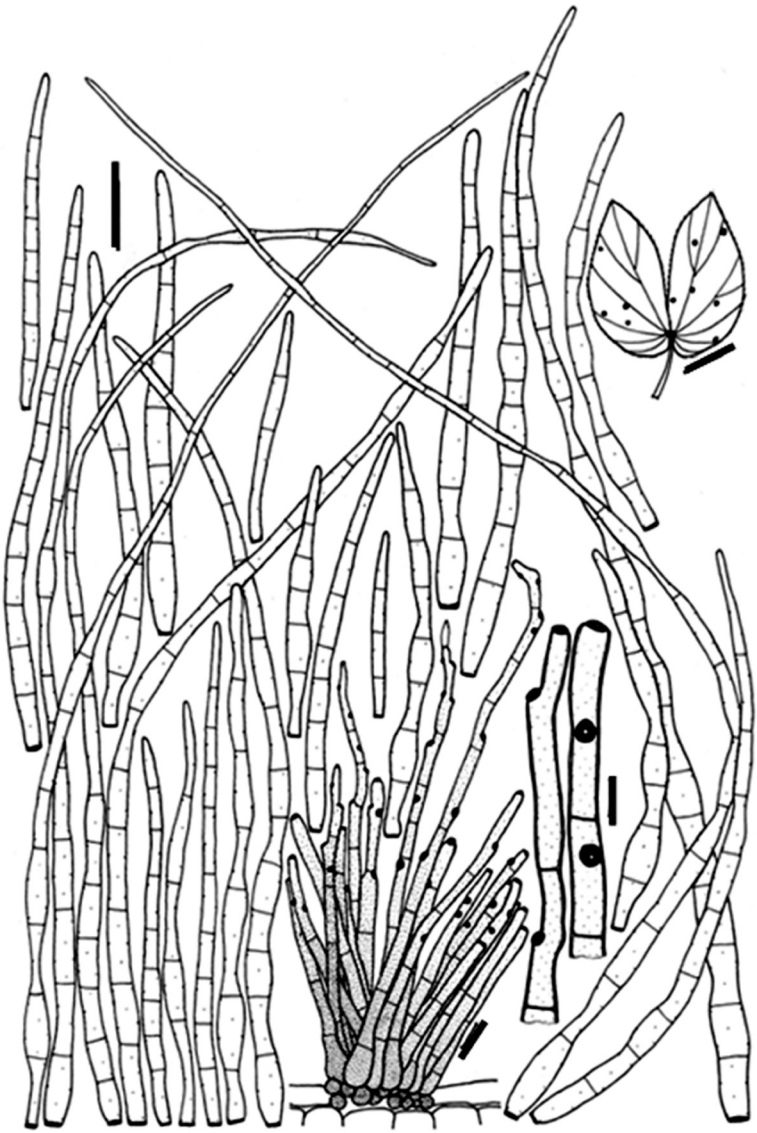

Fig. 1. *Cercospora mimosae-sensitivae* on *Mimosa sensitiva*. Lesions sparsely lesions distributed on two leaflets (top right) (bar = 10 mm); fascicle of conidiophores (bar = 10 μm) with details of the conidiogenous loci to the left (bar = 5 μm) and a surrounding sample of conidia (bar = 10 μm). Based on the holotype (UB Mycol. Col. 8303).

somewhat wider and, above all, pluriseptate conidia. Sutton & Pons (1980: 213) examined type material of *C. sensitivae* and considered it a nomen dubium. Braun (2000) re-examined the type material from LPS and a slide with a preparation of type material deposited at IMI. He found a few conidia agreeing with Chupp´s (1954) description, but the material was too meager to prove the generic affinity of this species, i.e., thickened and darkened-refractive hila, characteristic for *Cercospora* s. str., were not observed. Therefore, it could not be confirmed that this species pertains in the latter genus, i.e. an affinity of *C. sensitivae* to *Pseudocercospora* could not be excluded (U. Braun, in litt.). Beside *C. sensitivae*, only *C. canescens* Ellis & G. Martin (= *C. apii* Fresen. s. lat.) has been recorded on *Mimosa* spp. (Crous & Braun 2003), which is, however, clearly distinct by having acicular conidia with truncate base.

Cercosporoid fungi on *Faboideae*

Passalora sect. *Mycovellosiella*

Passalora acosmii A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 2

MycoBank, MB 512208

Passalorae sweetiae *similis, sed conidiophoris interdum per stomata emergentibus, pluriramosis, brevioribus, leviter angustioribus et conidiis interdum catenulatis.*

Specimen examined: **BRAZIL. Distrito Federal**: Planaltina, Estação Ecológica de Águas *Emendadas*, on living leaves of *Acosmium subelegans* (Mohlenbr.) Yakovlev [≡ *Sweetia subelegans* Mohlenbr.], 31 Aug 1998, *leg P.T.O. Ferreira* 7, **holotype** (UB Mycol. Col. 17204).

Etymology: *acosmii*, derived from the host genus.

Lesions 2–24 mm diam., hypophyllous, irregular, coalescent, yellowish to ochraceous, without a defined margin. Colonies exclusively hypophyllous, effuse, velvet or cottony, yellowish or ochraceus. Stromata absent or very poorly developed textura globosa, small, single-layered, substomatal. Primary conidiophores emerging through stomata, in loose fascicles, strongly branched, forming a complex network, 5–8 µm diam. Secondary conidiophores formed singly on branched creeping hyphae, 46–63 µm long, 5–7 µm diam. at the widest part, 2–4-septate, ochraceous to yellowish brown, thin-walled, smooth. Conidiogenous cells integrate, terminal or intercalary, polyblastic, sympodial, geniculate, with prominent and pigmented scars, 5–8 µm diam. Conidia solitary or rarely in short chains, straight or curved, broadly obclavate, cylindrical or obovoid, catenulate conidia obconically truncate at the base and conical-truncate at the apex, with thick and pigmented hilum, 2–4 µm wide, solitary conidia broadly round at the apex, 15–44 µm long, 5–7 µm diam. at the widest part, 1–3 µm at the base, 2–5 µm near the apex, 0–5-septate, yellow, ochraceous or light yellowish brown, thin-walled, smooth.

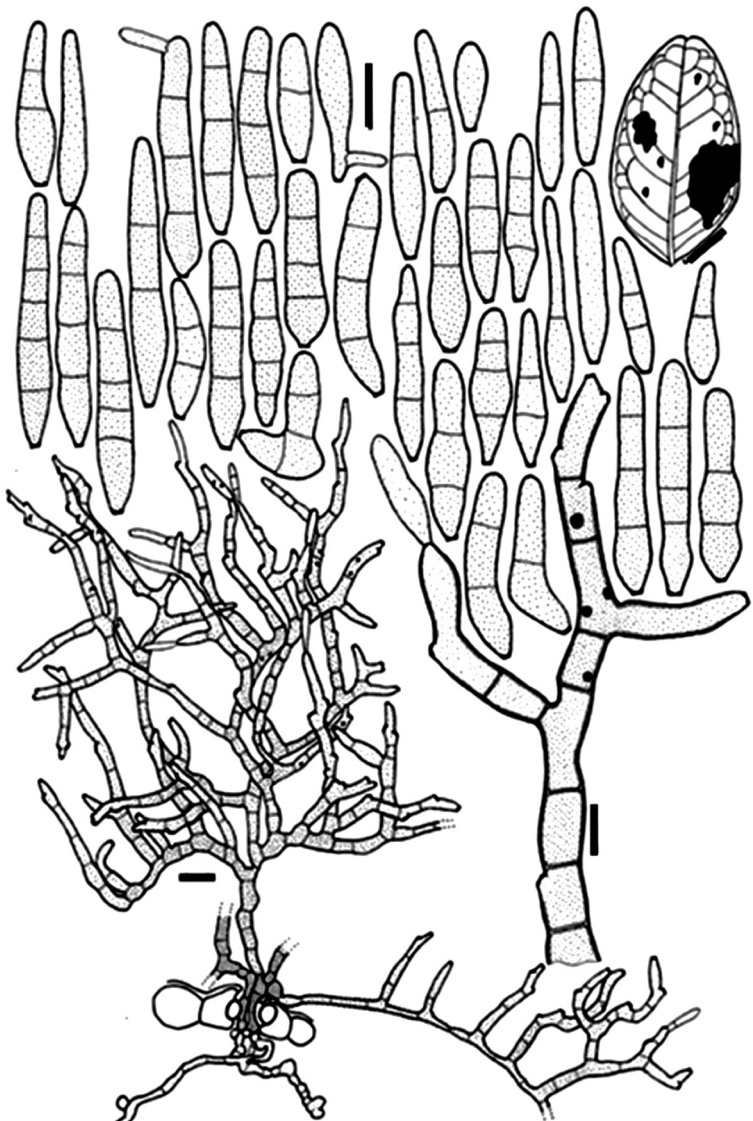

Fig. 2. *Passalora acosmii* on *Acosmium subelegans*. Lesions on a leaflet at top right (bar = 10 mm); branched superficial mycelium (bar = 10 μm) growing from a stoma with details of conidiophore and conidiogenous cells shown on the right side (bar = 5 μm), both topped by a sample of conidia with a variety of shapes (bar = 10 μm). Based on the holotype (UB Mycol. Col. 17204).

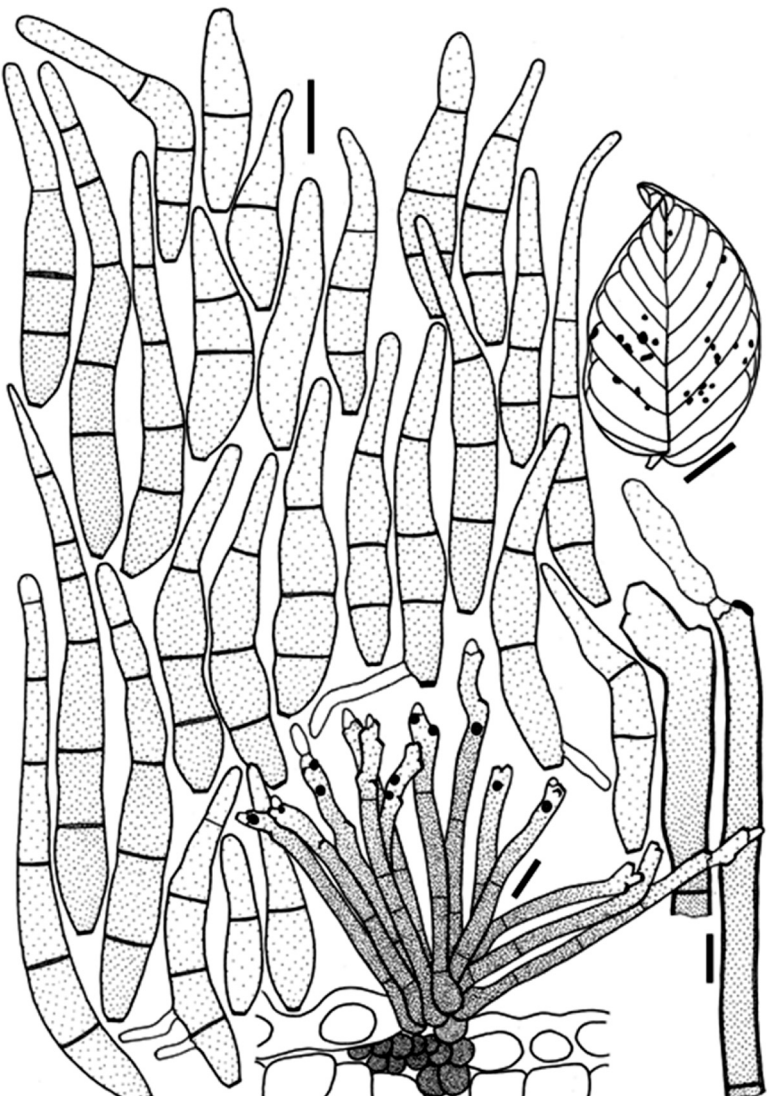

Fig. 3. *Passalora machaerii* on *Machaerium opacum*. Lesions on a leaflet (top right) shown as small scattered spots (bar = 10 mm); a representative sample of conidia (bar = 10 μm) on top of a fascicle of conidiophores (bar = 10 μm) originated from a substomatal stroma. Based on the holotype (UB Mycol. Col. 8667).

Comments: *Acosmium* is a genus of the *Faboideae* [*Leguminosae*, *Sophoreae*], previously considered a section of *Sweetia*. The new species *Passalora acosmii* resembles *P. sweetiae* K. Schub. & U. Braun [≡ *Cladosporium ferrugineum* Allesch., non *Passalora ferruginea* (Fuckel) U. Braun & Crous], known from Brazil, Minas Gerais, on *Sweetia bijuga* (Schubert & Braun 2005). The latter species is characterized by similar conidia, and leaf spots are lacking as in *P. acosmii*, but the conidiophores are consistently solitary, arising from superficial hyphae, unbranched, longer and wider, up to 213 × 10 µm. The Brazilian *Passalora chuppii* (Viégas) U. Braun & Crous (Chupp 1954, Crous & Braun 2003) on *Ormosia*, an allied genus of the *Sophoreae*, is a quite distinct phaeoramularia-like species, i.e., external hyphae with solitary conidiophores are lacking. There are two additional cercosporoid species in Asia on hosts of the *Sophoreae*, but they pertain to other genera, viz. *Cercospora sophorae* T.S. Ramakr. & K. Ramakr. and *Pseudocercospora cladrastidis* (Jacz.) J.K. Bai & M.Y. Cheng (Chupp 1954, Crous & Braun 2003). Among other mycovellosiella-like *Passalora* species on hosts of the *Faboideae* , there are only few species characterized by lacking stromata and branched conidiophores, viz. *Passalora hariotii* (Speg.) U. Braun & Crous (Deighton 1974) and *P. pirozynskii* (Deighton) U. Braun & Crous (Deighton 1987). However, *P. pirozynskii* is distinguished by having moderately branched conidiophores, less profuse than the net-forming conidiophores of *P. ascomii*, and narrower conidia formed singly. *P. hariotii* has also less branched conidiophores and solitary conidia.

Passalora sect. *Passalora*

Passalora machaerii A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 3

MycoBank, MB 512211

Passalorae dalbergiicolae *valde similis, sed stromatibus bene evolutis, 46–73 µm diam., conidiis longioribus, 0–7-septatis*.

Specimens examined: **BRAZIL. Distrito Federal**: Planaltina, Estação Ecológica Águas Emendadas, on living leaves of *Machaerium opacum*, 6 Jun 1995, *leg M. Sanchez* 893, **holotype** (UB Mycol. Col. 8667); **Goiás**: Cristalina, Fazenda Nova Índia, on living leaves of *M. acutifolium*, 10 Apr 1993, *leg R..B. Medeiros* 236, **paratype** (UB Mycol. Col. 3728); **Distrito Federal**: Brasília, Asa Norte, SQN 415, on living leaves of *M. acutifolium*, 2 May 1993, J. C. Dianese 871, **paratype** (UB Mycol. Col. 3857).

Etymology: *machaerii*, derived from the host genus.

Lesions 1–3 mm diam., amphigenous, circular or irregular, dark brown, without a delimiting margin. Colonies amphigenous, gregarious, yellowish brown. Mycelium internal. Stromata 46–73 µm diam., formed by cells of textura globosa, usually superficial or subepidermal, light brown. Conidiophores in loose fascicles, simple, straight or slightly curved, cylindrical, 76–130 µm long, 6–8 µm diam. at the widest part, 2–3-septate, light olivaceous, smooth, thin-

walled. Conidiogenous cells integrate, terminal, polyblastic, sympodial, geniculate, with prominent, thick, pigmented scars, 5–6 µm diam. Conidia solitary, cylindrical, obclavate, curved, sometimes fusoid, obconically truncate at the base with a thick, dark hilum; rounded to broadly rounded or obtuse at the apex, 31–96 µm long, 7–10 µm diam. at the widest part, 2–5 µm at the base, 3–5 µm near the apex, 0–7-septate, light olivaceous to subhyaline, smooth, thin-walled.

Comment: The genus *Machaerium* belongs in the *Faboideae* [*Leguminosae*, *Dalbergieae*]. Since species of the cercosporoid genera *Passalora* and *Pseudocercospora* are, as far as known, strictly confined to species of a single host genus or at most hosts of closely allied genera, it is necessary to compare the new species at first with allied host genera of the *Dalbergieae*. *Passalora machaerii* is characterized by lacking superficial hyphae, fasciculate conidiophores and conidia formed singly. Most species of *Passalora* known on allied hosts pertain to other morphological groups. *Passalora amazonica* U. Braun on cf. *Lonchocarpus* sp. in Brazil (Braun 2003) and *P. ougeiniae* (M.D. Mehrotra & R.K. Verma) U. Braun & Crous on *Dalbergia oojeinensis* in India (Crous & Braun 2003) are phaeoramularia-like, i.e. the conidia are formed in chains.

Passalora dalbergiae (S.K. Singh & P.N. Singh) U. Braun, Dianese & A. Hern.-Gut., **comb. nov.**

MycoBank, MB 512221

Bas.: *Mycovellosiella dalbergiae* S.K. Singh & P.N. Singh, in Singh et al., Indian Phytopathol. 57(2): 155, 2004.

On *Dalbergia sissoo* in India, *P. nervisequens* (J. Kranz) U. Braun & Crous on *Pterocarpus erinaceus* in Guinea (Braun et al. 1999, Crous & Braun 2003) and *P. pumila* (Syd. & P. Syd.) U. Braun & Crous on *Derris* spp. in Asia (Chupp 1954, Crous & Braun 2003) are mycovellosiella-like, i.e. they form superficial hyphae with solitary conidiophores. *Asperisporium pongamiae* (Syd.) Deighton (≡ *Passalora pongamiae* (Syd.) Subram.) on *Pongamia glabra* in Asia (Ellis 1976) is quite distinct by its verrucose conidia.

Passalora dalbergiicola (T.S. Ramakr. & K. Ramakr.) U. Braun & Crous, known from India on *Dalbergia volubilis* (Chupp 1954, Vasudena 1963, Ellis 1976, Crous & Braun 2003), is the only comparable species on an allied host. It is morphologically very close to *P. machaerii*, but differs in having small stromata and shorter, (1–)3(–4)-septate conidia, 25–45 × 7–10 µm.

There are various other morphologically comparable *Passalora* species on leguminous hosts, which are not closely allied to *Machaerium*. *Passalora atropunctata* (Racib.) U. Braun & O.F. Freire (≡ *Phaeoisariopsis atropunctata* (Racib.) U. Braun, = *Phaeoisariopsis caespitosa* (Petr. & Cif.) S.C. Jong & E.F.

Morris) on *Desmodium* spp. and *P. pulchella* (T.S. Ramakr.) U. Braun & Crous (≡ *Phaeoisariopsis pulchella* (T.S. Ramakr.) U. Braun & Bagyan.) are distinguished by the formation of genuine synnemata, much longer conidiophores and shorter, usually 3-septate conidia (Ellis 1976, Braun 1990). *Passalora aenea* (Cif.) U. Braun & Crous (= *Cercospora cassiae* Henn., non *Passalora cassiae* Syd.) on species of *Cassia*, *Chamaecrista* and *Senna*, *P. caracasana* Syd. on *Parosela barbata*, *P. desmanthi* (Ellis & Kellerm.) U. Braun on *Desmanthus* spp., *P. gliricidiasis* (Gonz. Frag. & Cif.) U. Braun & R.F. Castañeda on *Gliricidia* spp. and *P. personata* on *Arachis* spp. are characterized by having large, dense fascicles of conidiophores and shorter conidia with 0–4 septa (Chupp 1954, Deighton 1967, Ellis 1976, Crous & Braun 2003). *Passalora tephrosiae* S.A. Khan & M. Kamal on *Tephrosia* spp. in Asia and North Africa possesses verruculose conidia, i.e. this species is rather asperisporium-like.

Cercosporoid fungi on *Caesalpinioideae*

Passalora sect. *Mycovellosiella*

Passalora chamaecristae-orbiculatae A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 4
MycoBank, MB 512209

Passalorae grecianae *similis, sed laesionibus distinctis, conidiophoris solitariis et fasciculatis, angustioribus, 3–5 µm latis, conidiis angustioribus, 2–3 µm latis, interdum catenulatis.*

Specimen examined: **BRAZIL. Goiás**: Catalão, BR-050 Highway, Km 264, between Catalão and Davinópolis, on living leaves of *Chamaecrista orbiculata*, 6 Nov 1993, *leg M. Sanchez* 135, **holotype** (UB Mycol. Col. 5550).

Etymology: *chamaecristae-orbiculatae*, derived from the host species.

Lesions 2–40 mm diam., amphigenous, irregular, coalescent, occupying large areas limited by the main veins, violaceous-brown, limited by a dark brown margin. Colonies amphigenous, olivaceous, effuse. Stromata substomatal, 26–45 µm diam., textura globosa, sometimes forming rudimentary superficial stromata. Primary conidiophores in loose fascicles, emerging directly from substomatal or superficial stromata, simple or branched, straight or curved, with monopodial rejuvenations giving rise to annellate structures, 25–40 µm long, 3–5 µm diam. at the widest part, 2–6-septate, branched, thin-walled light olivaceous to light brownish olivaceous, smooth. Secondary conidiophores solitary, formed laterally on superficial, smooth hyphae. Conidiogenous cells integrated, terminal, polyblastic, sympodial; scars not very prominent, but slightly thickened and dark, 1–3 µm wide. Conidia solitary, occasionally in simple or branched chains, filiform to cylindrical, straight or curved, shorter conidia obclavate, obconically truncate at the base with a plane and dark hilum (1–2 apical hila on catenate conidia), obtuse to rounded at the apex, 27–112 µm

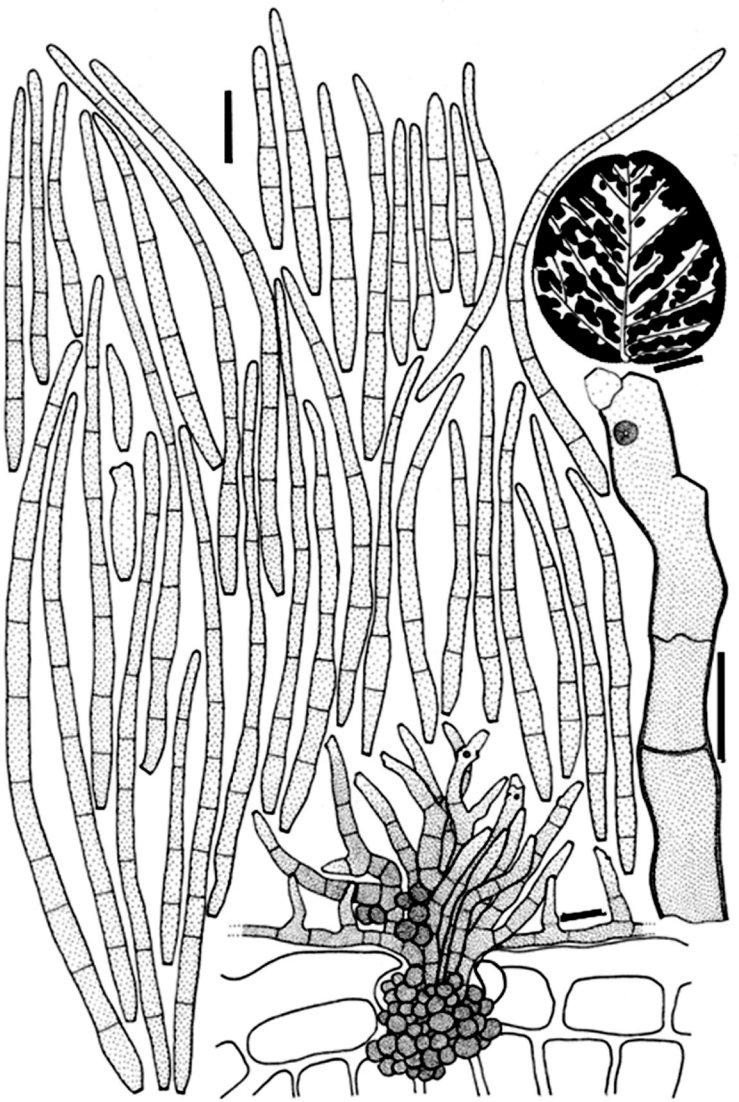

Fig. 4. *Passalora chamaecristae-orbiculatae* on *Chamaecrista orbiculata*. Extensive coalescent lesions on a leaflet (top right) (bar = 10 mm); a representative sample of conidia (bar = 10 μm) on top of a fascicle of branched superficial mycelium and conidiophores (bar = 10 μm); detail of the conidiophore and conidiogenous cell to the right (bar = 5μm). Based on the holotype (UB Mycol. Col. 5550).

long, 2–3 µm diam. at the widest part, 1–2 µm at the base and near the apex, 2–11-septate, light olivaceous, smooth, thin-walled.

Comment: Several *Passalora* species are known on hosts belonging to the *Caesalpinioideae*, but most of them belong to other morphological sections. *Passalora aenea* (= *Cercosporidium cassiae*) widespread on *Cassia*, *Chamaecrista* and *Senna* spp. (Deighton 1967, Brown & Morgan-Jones 1977, Crous & Braun 2003), *P. bauhiniicola* U. Braun on *Bauhinia benthamiana* in Venezuela (Braun 2001), *P. cercidicola* (Ellis) U. Braun on *Cercis* spp. in North America (Chupp 1954, Crous & Braun 2003), *P. chamaecristae* (Ellis & Kellerm.) U. Braun on *Cassia* s. lat. spp. in North America (Brown & Morgan-Jones 1977) and *P. schizolobii* M.J. Wingf. & Crous on *Schizolobium parahyba* in Ecuador (Wingfield et al. 2006), belong to section *Passalora*, i.e. superficial hyphae with solitary conidiophores are lacking. *Passalora bauhiniigena* U. Braun & Crous on *Bauhinia vahlii* in India (Crous & Braun 2003).

Passalora. caesalpiniae (Bhalla, A.K. Sarbhoy, M. Kulshr. & K.P.S. Kushwaha) U. Braun, Dianese & A. Hern.-Gut., **comb. nov.**
MycoBank, MB 512220
Bas.: *Phaeoramularia caesalpiniae* K. Bhalla, A.K. Sarbhoy, M. Kulshrestha & K.P.S. Kushwaha, Microbiol. Res. 156: 107, 2001.

On *Caesalpinia bonducella* in India (Bhalla et al. 2001) and *P. occidentalis* (Cooke) U. Braun, widespread on species of *Cassia* s. lat. (Chupp 1954, Crous & Braun 2003) are phaeoramularia-like, i.e. without superficial hyphae and solitary conidiophores, but with fasciculate conidiophores and catenate conidia. *Passalora greciana* (Syd.) U. Braun & Crous on *Cassia oxyphylla* in Central America (Chupp 1954, Brown & Morgan-Jones 1977, Crous & Braun 2003) is the only species comparable with the new *P. chamaecristae-orbiculatae*, but it is distinguished from the latter species by lacking lesions, consistently solitary, wider conidiophores, 5–7 µm diam., and wider conidia, 6–8 µm diam. (Brown & Morgan-Jones 1977). *Passalora bauhiniae* (Ellis & Everh.) U. Braun & Crous on *Bauhinia divaricata* in the USA (Braun 1998, Crous & Braun 2003) is another species of sect. *Mycovellosiella*, which is, however, quite distinct by having consistently solitary conidiophores and catenate, much smaller conidia, 10–25 × 2–5 µm, with (0–)1–2(–3) septa.

Passalora sect. *Passalora*

Passalora chamaecristicola A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 5
MycoBank, MB 512210

Passalorae bauhiniicolae *similis, sed conidiophoris longioribus, 66–131 µm, conidiis 0–5-septatis, tenuitunicatis, sed septis incrassatis.*

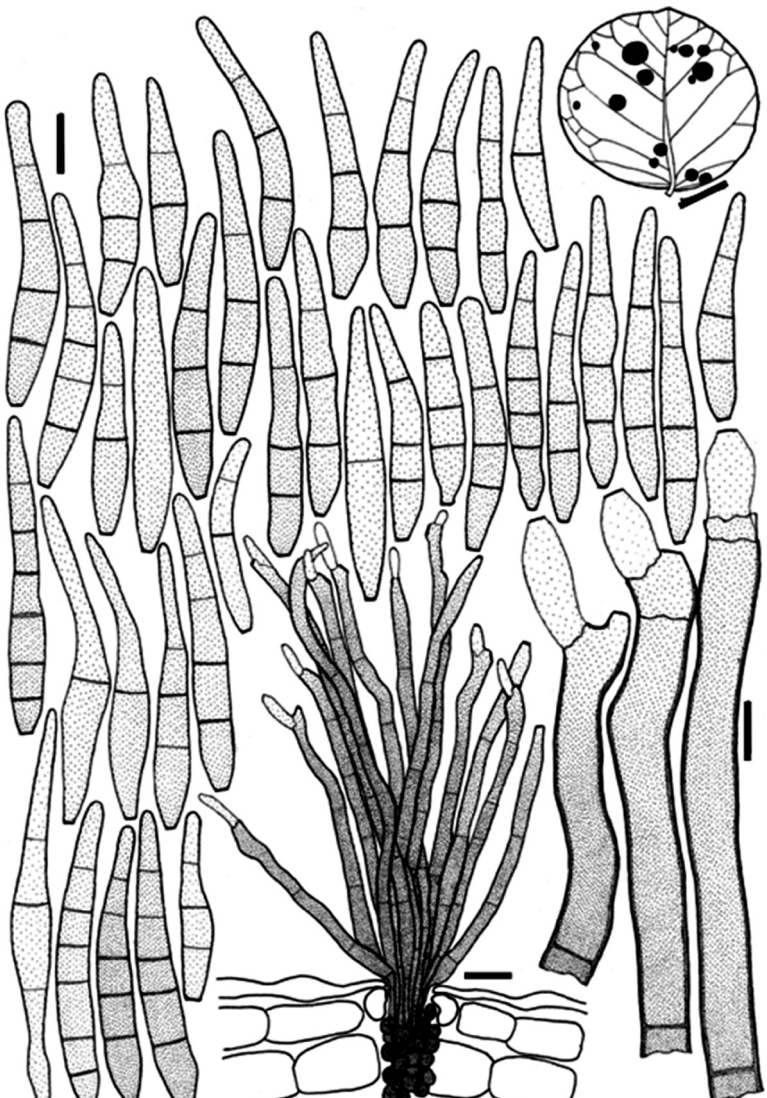

Fig. 5. *Passalora chamaecristicola* on *Chamaecrista orbiculata*. Circular leaf spots on a leaflet (bar = 10mm); sample of conidia (bar = 10 μm) on top of a fascicle of stomatal conidiophores originated from a substomatal stroma (bar = 10 μm); detail of the shape and proliferation of the integrate conidiogenous cells (bar = 5μm). Based on the holotype (UB Mycol. Col. 3682).

Specimens examined: **BRAZIL. Goiás**: Pirenópolis, Hotel Fazenda Pousada dos Pirineus, on living leaves of *Chamaecrista orbiculata*, 25 Apr 1993, *leg J.C. Dianese* 807, **holotype** (UB Mycol. Col. 3682). **Distrito Federal**: Planaltina, Estação Ecológica Águas Emendadas, on living leaves of *Chamaecrista orbiculata*, *leg A.S. Alves*, 6 Mar 1995, **paratype** (UB Mycol. Col. 7411 and 8639); 5 Mar 1997, *leg M. Sanchez* 2397 **paratype** (UB Mycol. Col. 13642).

Etymology: *chamaecristicola*, i.e. inhabiting *Chamaecrista*.

Lesions 1–5 mm diam., amphigenous, circular, sometimes coalescent, dark brown, surrounded by a yellowish halo. Colonies amphigenous, caespitose, dark brown. Stromata moderately developed, 20–53 µm diam., textura globosa, substomatal. Conidiophores loosely fasciculate, emerging directly from the substomatal stroma, divergent, slightly curved, 66–131 µm long, 4–6 µm diam. at the widest part, 3–5-septate, brown, smooth, with annellate structures formed by enteroblastic, monopodial rejuvenation of the conidiophores. Conidiogenous cells terminal, integrate, polyblastic, sympodial, sometimes geniculate, slightly pigmented, light brown; *scars* slightly prominent, thickened and somewhat darkened, 3–5 µm wide. Conidia solitary, slightly curved, straight, obclavate or cylindrical, obconically truncate to truncate at the base, with a slightly pigmented hilum, rounded at the apex, 31–65 µm long, 4–7 µm diam. at the widest part, 2–3 µm at the base, 2–4 µm near the apex, light brown, thin-walled, smooth, but aseptate or 1–5-septate, with up to three thick septa, olivaceous to brown.

Comment: Due to lacking superficial mycelium, conspicuous conidiogenous loci and pigmented, solitary conidia, the new species on *Chamaecrista orbiculata* has to be placed in *Passalora* sect. *Passalora*, and is morphologically close to *P. bauhiniicola* (Braun 2001), described from Venezuela on *Bauhinia benthamiana*. However, the latter species differs from *P. chamaecristicola* in having much shorter conidiophores, 30–70 µm long, with 3–8 unthickened septa. *P. cercidicola*, another species of sect. *Passalora*, possesses similar conidia, but the conidial septa are thin-walled and the conidiophores are much longer, up to 300 µm (Chupp 1954). *Passalora schizolobii* is quite distinct by its much narrower conidia, 3–4 µm wide (Wingfield et al. 2006), and *P. aenea* has much wider conidia, ranging from 8 to 12 µm (Deighton 1967, Brown & Morgan-Jones 1977). *Passalora chamaecristae* is distinguished from the new species by its much shorter conidiophores, 15–70 µm long, subhyaline to very pale brownish conidia and lacking stromata. Furthermore, *P. chamaecristicola* is characterized by conidiophores with annellate structures formed by enteroblastic, monopodial rejuvenation, which are lacking in all comparable *Passalora* species on hosts of the *Caesalpiniaceae*.

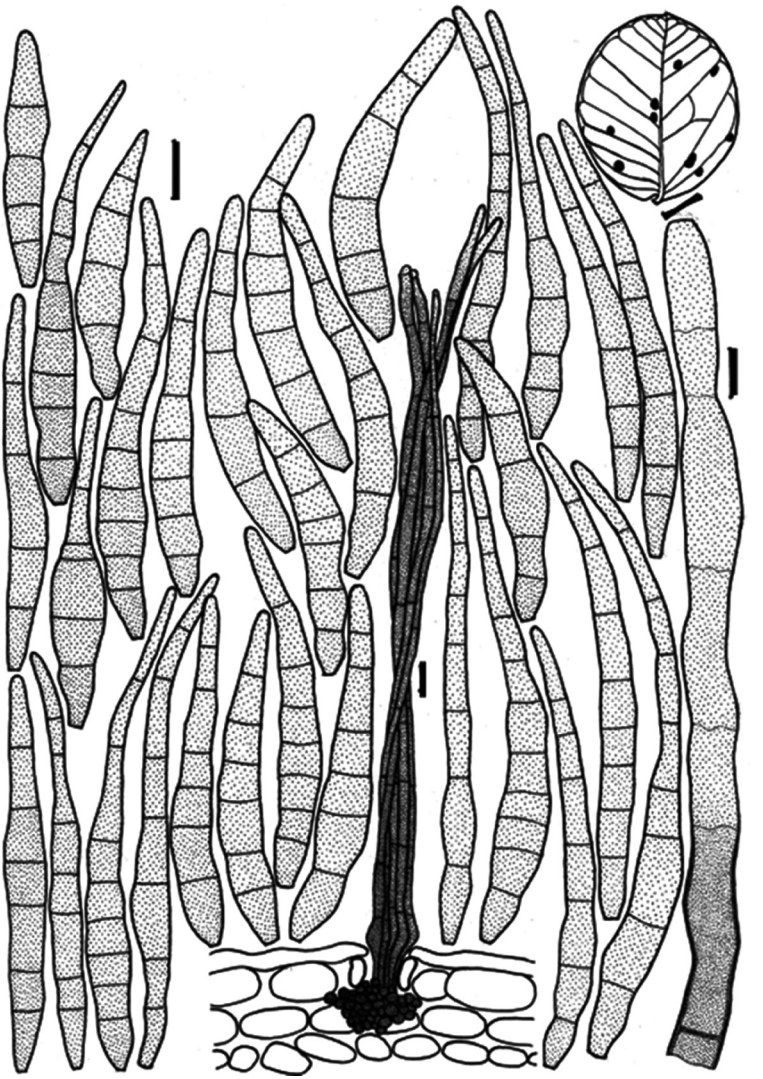

Fig. 6. *Pseudocercospora exilis* on *Chamaecrista orbiculata.* Circular leaf spots on a leaflet (bar = 10 mm); sample of conidia with inconspicuous conidiogenous loci (bar = 10 μm) on top of a synnematous fascicle of stomatal conidiophores originated from a substomatal stroma (bar = 10 μm); detailed view of a conidiogenous cells (bar = 5μm). (UB Mycol. Col. 1477).

Pseudocercospora

Pseudocercospora exilis A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 6

MycoBank, MB 512212

Pseudocercosporae caesalpiniicolae *similis, sed synnematibus longioribus et angustioribus, 149–332 × 7–23 µm, et cellulis conidiogenis percurrentibus.*

Specimens examined: **BRAZIL. Distrito Federal**: Brasília, Península Norte, on living leaves of *Chamaecrista orbiculata*, 9 Aug 1992, *leg J.C. Dianese* 396, **holotype** (UB Mycol. Col. 1477); 11 Jul 1993, *leg J.C. Dianese* 947, **paratype** (UB Mycol. Col. 4084); **Maranhão**: Balsas, 1 km SE from Ribeirãozinho, 04 Abr 1995, *leg M.A. de Freitas* 81, **paratype** (UB Mycol. Col. 8044).

Etymology: *exilis*, derived from the thin and delicate synnemata shown by the species.

Lesions 2–5 mm diam., amphigenous, circular, oval or irregular, light brown to grayish brown in the centre, surrounded by a dark brown margin. Colonies amphigenous, scattered, dark brown. Stromata 25–50 µm diam., formed by cells of textura globosa, substomatal. Synnemata parallel and determinate, composed of 5–13 conidiophores, 149–332 µm long or occasionally longer, 7–23 µm diam. immediately above the base. Conidiophores 5–7 µm diam., 6–14-septate, brown, smooth, thin-walled, synnematous. Conidiogenous cells integrate, terminal, percurrent, light brown; conidiogenous loci inconspicuous, truncate, neither thickened nor pigmented. Conidia solitary, curved, straight or slightly flexuous, obclavate, narrowly obclavate or fusoid; obconically truncate at the base, with an unthickened hilum; rounded to broadly rounded at the apex, 38–103 µm long, 6–9 µm diam. at the widest part, 2–3 µm at the base, 2–3 µm near the apex, 4–10-septate, sometimes constricted at some of the septa, light brown to light olivaceous-brown, smooth, thin-walled.

Comment: Based on unthickened, non-pigmented conidiogenous loci and conidial hila, this species has to be assigned to *Pseudocercospora*. Due to the structure of the conidiomata, it resembles *P. vitis*, the type species, characterized by conidiophores aggregated in true synnemata. However, the new species differs from all synnematous *Pseudocercospora* spp. on *Leguminosae* s. lat. in having very slender synnemata and, above all, percurrently proliferating conidiogenous cells. Percurrent conidiogenous cells are above all known from former *Cercostigmina* U. Braun (Braun 1993) species, which are now included in *Pseudocercospora* (Crous & Braun 2003). Only few synnematous *Pseudocercospora* species are known on hosts of the *Caesalpinioideae*. *P. chamaecristae* U. Braun & O.F. Freire, described from Brazil on *Chamaecrista* sp. (Braun & Freire 2002) is a similar species, but distinct by its wider synnemata, 120–280 × 15–60 µm, and shorter, only 1–4-septate conidia, 25–35 × 5–8(–10) µm.

A second species, previously referred to as *Phaeoisariopsis*, is known from Brazil on *Caesalpinia bonducellae* (Hennings 1904, Ellis 1976):

Pseudocercospora bonducella (Henn.) U. Braun, Dianese & A. Hern.-Gut. **comb. nov.**

MycoBank, MB 512222

Bas.: *Helminthosporium bonducellae* Henn., Hedwigia 43: 95, 1904.

Syn.: *Phaeoisariopsis bonducellae* (Henn.) Deighton, in Ellis, More Dematiaceous Hyphomycetes: 233, 1976.

Specimens examined: **BRAZIL**. Rio de Janeiro, on living leaves of *Caesalpinia bonduncellae*, *leg Ule* 1077, **holotype** of *H. bonducellae* (B).

Illustration: Ellis (1976: 233, Fig. 173 B).

Due to unthickened, non-pigmented conidiogenous loci and conidial hila, this species is a true *Pseudocercospora*. However, the conidiophores are aggregated in dense fascicles, i.e. they are not synnematous. This species is characterized as follows: Leaf spots amphigenous, subcircular to angular-irregular, 1–5 mm diam., occasionally vein-limited, pale to medium brown, reddish brown, later pale grayish brown, with a narrow reddish brown marginal line, occasionally somewhat raised; caespituli hypophyllous, scattered to dense, dark brown; mycelium internal; stromata small, substomatal, 10–30 µm diam., brown, often somewhat erumpent, cells 2–7 µm diam.; conidiophores in large, more or less dense fascicles, but not in synnemata, 50–180 × 3–8 µm, subcylindrical-filiform to somewhat sinuous or slightly genicuate, unbranched or rarely branched, pale to medium olivaceous-brown, pluriseptate throughout, smooth, thin-walled, wall up to 1 µm wide; conidiogenous cells integrated, terminal, 10–25 µm long, barely to slightly geniculate, conidiogenous loci inconspicuous; conidia solitary, obclavate-cylindrical, (25–)30–110 × (6–)7–9(–10) µm, (1–)3–10-septate, pale to medium olivaceous-brown, thin-walled, smooth, apex obtuse, mostly broadly rounded, base short obconically truncate, hila 2–2.5(–3) µm wide, unthickened, not darkened.

Yen et al. (1982) described *Phaeoisariopsis caesalpiniae* from India, also on *Caesalpinia bonducellae*. Deighton (1990) supposed that this species may be identical with *P. bonducellae*. The re-examinations of type material and numerous additional collections from India showed that the two species are morphologically very similar. However, the Indian fungus is distinct by conidiophores in loose to dense fascicles as well as true synnemata, much narrower conidia, 30–100 × 3–6.5 µm, not constricted at the septa, and somewhat narrower hila, 1–2 µm diam. Therefore, the Indian fungus is considered a separate species, which also belongs in *Pseudocercospora* based on inconspicuous conidiogenous loci:

Pseudocercospora caesalpiniicola U. Braun, Dianese & A. Hern.-Gut., **nom. nov.**
MycoBank, MB 512238

Bas.: *Phaeoisariopsis caesalpiniae* J.M. Yen, A.K. Kar & B.K. Das, Mycotaxon 16: 84, 1982, non *Pseudocercospora caesalpiniae* Goh & W.H. Hsieh, 1989.

Specimens examined: **INDIA**. **Bengal**: Nadia, Palpara, on *Caesalpinia bonducellae*, 25 Nov 1979, B.K. Das, **isotype** of *P. caesalpiniae* (IMI 37382); **Jabalpur**, Feb 1969, *leg G.P. Agarwal* (IMI 138933); Calcutta, 29 Mar 1979, *leg J.B. Ray* (IMI 237382) and 24 Aug 1978, *leg A.K. Kar* (IMI 231245); **U.P.,** Gorakhpur, 25 Jan 1980, *leg A.K. Singh* (IMI 244863), 29 Jan 1980, *leg A.N. Rai* (IMI 246391) and Feb 1984, *leg P. Narayan* (IMI 285861); on *Caesalpinia* '*sepiaria*' (probably *C. bonducellae*), **Jabalpur**, Aug 1964, *leg V.P. Sahni* (IMI 108639).

All Indian collections agree well with the original description and illustration of this species by Yen et al. (1982). On account of rather slender synnemata, usually monoblastic, non-geniculate conidiogenous cells and very similar conidia, *P. caesalpiniicola* is morphologically very close to *P. exilis*, but the synnemata are wider, composed of up to 35 conidiophores, and percurrent proliferations of the conidiogenous cells have not been observed.

Phaeoisariopsis indica (Subram.) Deighton (Ellis 1976) on an unknown leguminous host in India with similar synnemata and conidia belongs probably in *Pseudocercospora*, but the synnemata are wider and the conidiogenous cells are sympodial.

Pseudocercospora luzianiensis A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 7
MycoBank MB 512213

Pseudocercosporae caesalpiniicolae *similis, sed synnematibus longioribus, 315–600 µm, et cellulis conidiogenis sympodialiter proliferantibus.*

Specimen examined: **BRAZIL. Goiás**: Luziânia, Fazenda Roberto Ronald, on living leaves of *Chamaecrista setosa*, 10 Jun 1993, *leg J.C. Dianese* 884, **holotype** (UB Mycol. Col. 3891).

Etymology: *luzianiensis*, derived from Luziânia, the place of collection.

Lesions 0.5–2 mm diam., amphigenous, circular or irregular, dark brown, without a defined delimiting margin. Colonies exclusively hypophyllous, generally 1–2 synnemata in each lesion, dark brown. Stromata 50–88 µm diam., well-developed, formed by cells of textura globosa, substomatal, light brown. Synnemata very compacted, textura parallela, determinate, 315–600 µm long, 12–47 µm diam. immediately above the base, formed by 6–41 conidiophores, dark brown. Individual conidiophores 141–600 µm long, 3–5 µm diam. at the widest part, 8–21-septate, with enteroblastic, monopodial rejuvenation, leaving annellate structures, light brown to light olivaceous, smooth, thin-walled. Conidiogenous cells integrated, terminal or intercalary, mono- or polyblastic, sympodial, geniculate, conidiogenous loci truncate, unthickened, but somewhat pigmented. Conidia solitary, curved, sometimes straight or flexuous, obclavate, cylindrical or fusoid; obconically truncated at the base

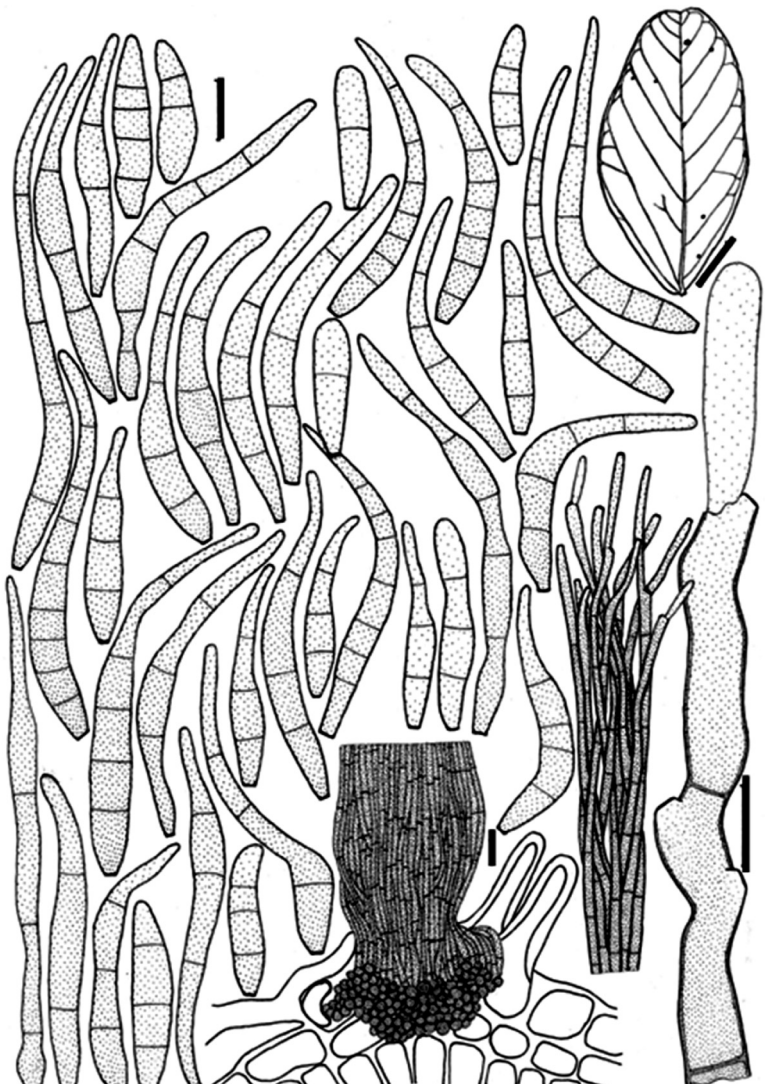

Fig. 7. *Pseudocercospora luzianiensis* on *Chamaecrista setosa*. Small leaf spots on a leaflet (bar = 10 mm); sample of conidia with inconspicuous conidiogenus loci (bar = 10 μm) on top of a synnematous fascicle of stomatal conidiophores originated from a substomatal stroma (bar = 10 μm); detailed view of a conidiogenous cells (bar = 5μm). (UB Mycol. Col. 3891).

with unthickened, but dark hilum; obtuse, rounded to broadly rounded at the apex; 22–89 μm long, 5–7 μm diam. at the widest part, 2–3 μm at the base, 2–5 μm near the apex, 1–8-septate, light olivaceous to subhyaline, smooth, thin-walled.

Comment: *Pseudocercospora luzianiensis* is a synnematous, phaeoisariopsis-like hyphomycete. The conidiogenous cells are distinctly geniculate caused by sympodial proliferation. The structure of the conspicuous conidiogenous loci is somewhat intermediate between *Passalora* and *Pseudocercospora*. The loci are truncate, rigid, somewhat darkened, but not distinctly thickened. These are structures comparable with the loci of *P. vitis*, the type species of *Pseudocercospora*. Therefore, this fungus is treated as a new species of the latter genus. Synnematous *Passalora* species on hosts of the *Caesalpinioideae* are unknown, but a few synnematous species have been assigned to *Pseudocercospora*. The new species *P. exilis* is quite distinct from all of them by its very slender synnemata and percurrent conidiogenous cells. *Pseudocercospora chamaecristae* (Braun & Freire 2002) is easily distinguishable by its much shorter conidiophores, only up to 280 μm long, and shorter, 1–4-septate conidia, 25–35 × 5–8(–10) μm. However, *P. caesalpiniicola* is morphologically rather close to *P. luzianiensis*, but differs in having much shorter conidiophores, only up to 215 μm in length, and non-geniculate, mostly monoblastic conidiogenous cells.

Pseudocercospora chamaecristigena A. Hern.-Gut. & Dianese, **sp. nov.** Fig. 8

MycoBank, MB 512214

Pseudocercosporae luzianiensis *similis, sed synnematibus brevioribus (208–335 μm), conidiophoris ad basim saepe inflatis, conidiis crassitunicatis et septis incrassatis. Differt a* P. caesalpiniicola *synnematibus longioribus (208–335 μm), conidiophoris ad basim saepe inflatis, cellulis conidiogenis sympodialiter proliferantibus, conidiis crassitunicatis et septis incrassatis.*

Specimen examined: **BRAZIL. Mato Grosso**: Cuiabá, Parque Nacional Chapada dos Guimarães, on living leaves of *Chamaecrista* sp., 11 Apr 1996, l*eg M. Sanchez* 1656, **holotype** (UB Mycol. Col. 11427).

Etymology: *chamaecristigena*, i.e. inhabiting *Chamaecrista*.

Lesions 2–7 mm diam., amphigenous, oval or irregular, grayish brown, surrounded by a dark brown margin. Colonies amphigenous, scattered, dark brown. Stromata 35–83 μm diam., substomatal, formed by cells of textura globosa. Conidiophores in synnemata of textura parallela, determinate, 208–335 μm long, 20–83 μm diam. immediately above the base, composed by 16–65 individual conidiophores, simple, flexuous, cylindrical, 3–5 μm diam. at the widest part, often characteristically dilated just above the leaf surface, 4–12-septate, brown or light brown, smooth, thin-walled. Conidiogenous cells integrated, terminal, mainly monoblastic, sometimes polyblastic, sympodial,

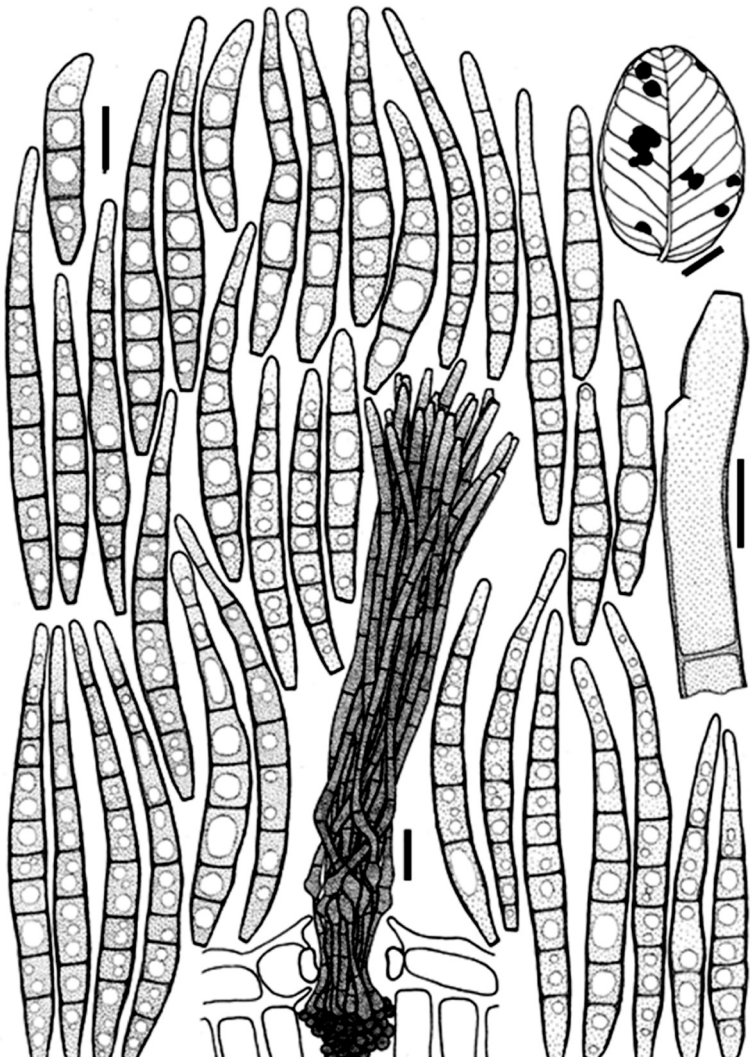

Fig. 8. *Pseudocercospora chamaecristigena* on *Chamaecrista* sp. Large coalescent circular or irregular leaf spots on a leaflet (bar = 10 mm); sample of thick walled conidia and inconspicuous conidiogenus loci (bar = 10 μm) on top of a synnematous fascicle of stomatal conidiophores originated from a substomatal stroma (bar = 10 μm); detailed view of a conidiogenous cell (bar = 5μm). (UB Mycol. Col.

scars not very prominent, neither distinctly thickened nor pigmented. Conidia solitary, straight or slightly curved, obclavate, sometimes cylindrical, obconically truncate at the base, with an unthickened and only barely pigmented hilum, rounded to broadly rounded at the apex, 35–79 µm long, 5–8 µm diam. at the widest part, 2–3 µm at the base, 2–4 µm near the apex, 3–10-septate, walls and septa somewhat thickened, light olivaceous-brown, smooth.

Comment: *Pseudocercospora chamaecristigena* is distinguished from all other synnematous *Pseudocercospora* spp. on hosts of the *Caesalpinioideae* by its conidiophores which are enlarged at the very base. Furthermore, *P. luzianiensis* has much longer synnemata, up to 600 µm, and thin-walled conidia with thin septa. *Pseudocercospora caesalpiniicola* has shorter synnemata, only up to about 200 µm, non-geniculate conidiogenous cells and thin-walled conidia, and *P. chamaecristae* is quite distinct by its much shorter, thin-walled, 1–4-septate conidia, 25–35 × 5–8(–10) µm.

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